

REMARKS

The Official Action of November 3, 2004, and the prior art cited and relied upon therein have been carefully studied. The claims in the application are now claims 1-3, and these claims define patentable subject matter warranting their allowance. Favorable reconsideration and such allowance are respectfully urged.

Claims 1-3 remain in the application for consideration.

The Examiner has rejected claims 1-3 under 35 U.S.C. §103(a) as being unpatentable over JP'332 in view of Yoshida. Applicant has amended the claims to provide better clarity and submits that these amendments raise no new issues.

Applicant respectfully submits that the cited prior art combination fail to teach or suggest the structural features detailed below. Absent the combination of these structural features, it is clear that the cited prior art combination will not function in the unique manner of the claimed invention:

- The cage bar (4) is provided at the axially opposing ends (13) thereof with guide surfaces

(18) against which the rollers (7) are carried in rolling-contact.

- The circular outside surface or the radially outside surface (22) of the cage is made flush across the overall axial length.
- The cage bar (4) is provided at the axially opposite thick ends (13) thereof with the outside and inside retainer lugs (15, 16), which extends from the guide surfaces (18) into the associated pocket (6) to keep the roller (7) against falling away.
- The slender area (17) of the cage bar (4) is defined in a manner having an inside surface (24T) of an axial length extending over a range of from 50% to 80% of the overall axial length of the pocket (6).
- The slant surface (20) connecting the inside surface (24T) of the slender area (14) and any one of the thick ends (13) is set to slope to a plane normal to the slender area (14), with an angle ( $\theta$  2/2) less than 45 deg.

This application is directed to a roller bearing cage having circular rims that are split in two halves similar to the cage claimed in USP '564 which is the parent of this application.

However, this application is further focused on the structural features illustrated in especially Figs. 3, 9 and 10 of the parent application for enhancing the performance of the roller bearing cage of USP'584 while reducing its weight without reduction in its stiffness.

The invention of this application is directed to the same unique results as in the parent application, especially as described in the original specification, from page 25, line 22 to page 26, line 8; "...The roller bearing cage constructed as stated earlier weighs less, while its guide surface provides a result equivalent to that of the cage of the parent application. The roller bearing cage of the claimed invention, moreover, is constructed so as to ensure stiffness in the (semicircular) rim (3), by increasing the modulus of its longitudinal section, and also increasing the area of the outer periphery of the roller bearing cage 1. Thus, the claimed invention provides a roller bearing cage that uniquely carries the loads imposed by high-compression, high-speed engines (despite being split into two cage halves).

The claimed invention includes the unique structural features shown in Figs. 3 and 9 discussed above result in the following improvement in performance:

- The annular corner (26) where the axial end surface (25) merges with the outside periphery (22) of the semicircular rim (3) is rounded to extend the circular outside surface of the cage in the peripheral area;
- The slant surfaces (20) defining the recess (19) begins sloping at axially opposing positions to make the recess (19) which extends over a range from 50% to 80% of the overall axial length (Bp) of the pocket (6) as compared to the recess of the parent application which has a smaller axial length. The claimed cage also has a slope of angle less than 45 degrees to ensure an increased modulus of its longitudinal section.

This feature uniquely contributes to making the cage weigh less, while making certain that guide surfaces have carrying areas that have appropriate stiffness.

- The annular corner where the inside peripheral surface (24) merges with any one end of the

axially opposing end surfaces (25) of the semicircular rims (3) is chamfered off into a depth reaching two-thirds of the radial thickness of the associated rim (3) to form the slant annular surface (21), which slopes to a plane normal to the axial direction of the rim (3), with an angle  $\theta$  1 less than 45 degrees. The chamfered slant surface (21) also contributes to making the cage weigh less, without compromising its stiffness.

Applicant does not agree with the Examiner's indication that the dimensions discussed above are a matter of design choice which solve no stated problem or have any particular purpose, and therefore the claimed cage would perform equally well with a variety of dimensions. As indicated above, the structural features identified above, not shown in the prior art combination, function in a unique combination to enhance the performance of the cage of USP '584 without any reduction of stiffness accompanied by a reduction in weight.

The prior art documents made of record and not relied upon have been noted along with the implication that such documents are deemed by the PTO to be insufficiently

Appln. No. 10/687,800  
Amdt. dated February 3, 2005  
Reply to Office Action of November 3, 2004

pertinent to warrant their applications against any of  
applicant's claims.

Applicant submits that the claimed invention  
patentably defines over the cited prior art.

Favorable reconsideration and allowance are  
earnestly solicited.

Respectfully submitted,

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